

REMARKS

Claims 1-20 are pending in this application.

The Examiner objected to the drawings for failing to show the limitations of claims 8 and 9. Claims 8 and 9 have been amended to address the Examiner's concerns.

The Examiner rejected claims 8-9, 13-14 and 19 under 35 U.S.C. Section 112, first paragraph, as failing to comply with the written description requirement. Claims 8 and 9 have been amended to address the Examiner's concerns.

The Examiner rejected claims 1-20 as directed to non-statutory subject matter. Applicants respectfully traverse the Examiner's rejections. "It is now commonplace that an application of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection." *Diamond v. Diehr*, 450 U.S. 175, 187-88 (1981). To determine if a claim is directed towards a practical application of an abstract idea, the claim must be considered as a whole. *Diehr*, 450 U.S. at 188. A claimed process is statutory if the process claim results in a physical transformation with a practical application, or otherwise produces a useful, tangible, and concrete result. *See Id.* at 183-83, 192-93. Independent claim 1 recites, "computing an N-point FFT/IFFT of a signal ... and storing the transformed signal." Claim 1 is directed to statutory subject matter because it produces a useful, tangible and concrete result, a transformation of a signal. Independent claim 3 similarly recites, "means for computing a plurality of stages of an N-point FFT/IFFT of the signal ... and means for storing inputs and output of the means for computing," and is directed to statutory subject matter because the system produces a useful, tangible and concrete result, a transform of the signal. Independent claim 5 similarly recites "[a] computer program product comprising computer readable program code stored on a computer readable storage medium embodied therein for computing a Fast Fourier Transform (FFT) or Inverse Fast Fourier transform (IFFT) of a signal," and is directed to statutory subject matter for similar reasons to those set forth above. Independent claim 16 similarly recites, "[a] computer-readable memory medium whose contents cause a system having a plurality of processors to perform a linear scalable method of transforming a signal," and is directed to statutory subject matter for similar reasons to those set forth above.

The Examiner rejected claims 1-20 under 35 U.S.C. Section 103(a) as obvious over U.S. Patent No. 5,991,787 issued to Abel in view of U.S. No. 6,792,441 issued to Jaber. Applicants respectfully traverse the Examiner's rejections.

Applicants previously argued that Abel was not an appropriate primary reference because the claims in the present application are directed to linearly scalable methods, systems and products for computing FFTs or inverse FFTs on multiprocessor systems, while Abel is directed to reducing peak spectral error for a specific processor, namely an MMX<sup>TM</sup> processor, using a specific instruction set and configuration. Abel reduces peak spectral error using rounding. Abel is not directed to linear scalability. Thus, the Examiner's assertion that Abel discloses "a linear scalable method" is incorrect. The Examiner failed to respond to Applicants' argument that Abel is not directed to linear scalability in the current office action, and Applicants continue to contend that Abel is not an appropriate primary reference because it does not address linear scalability. Further, Jaber is directed to specific hardware architectures, and is not directed to achieving linear scalability. Thus one would not be motivated to combine Abel and Jaber to obtain linear scalability in a multiprocessor system.

Turning to the language of the claims, claim 1 as amended recites, "[a] linear scalable method ... comprising ... computing an N-point FFT/IFFT of a signal using a first plurality of butterfly computational stages, each stage in the first plurality of stages employing a plurality of butterfly operations having a first radix, wherein each of the butterfly operations in each stage in the first plurality of stages has a single, un-nested computation loop of the first radix." Claim 16 recites similar language. Neither Abel nor Jaber teach, suggest or motivate a linear scalable method comprising a first plurality of stages employing a plurality of butterfly operations having a first radix, wherein each of the butterfly operations in each stage in the first plurality of stages has a single, un-nested computation loop of the first radix, as recited. Accordingly, claims 1 and 16 are not rendered obvious by Abel, alone or in combination with Jaber. Claims 2 and 7-11 depend from claim 1 and claims 17-20 depend from claim 16, and are allowable at least by virtue of their dependencies.

Claim 3 as amended recites, "[a] linear scalable system ... comprising: means for computing a plurality of stages of an N-point FFT/IFFT using in each stage of the plurality of


stages a plurality of butterfly operations, wherein each butterfly operation employs a single butterfly computation loop of a first radix and without employing nested loops.” Neither Abel nor Jaber teach, suggest or motivate a linear scalable system comprising: means for computing a plurality of stages of an N-point FFT/IFFT using in each stage of the plurality of stages a plurality of butterfly operations, wherein each butterfly operation employs a single butterfly computation loop of a first radix and without employing nested loops, as recited. Accordingly, claim 3 is not rendered obvious by Abel, alone or in combination with Jabar. Claims 4 and 12-15 depend from claim 3, and are allowable at least by virtue of their dependencies.

Claim 5, as amended, recites, “[a] computer program product ... for computing a Fast Fourier Transform (FFT) or Inverse Fast Fourier transform (IFFT) in a multiprocessing system using a decimation in time linear scalable approach, comprising: computer readable program code means configured for ... implementing the remaining ( $\log_2 N - 2$ ) stages using radix-2 butterfly operations, wherein each radix-2 butterfly operation employs a single radix-2 butterfly computation loop without employing nested loops.” As mentioned above, neither Abel nor Jaber teach, suggest or motivate a linear scalable method. Thus, claim 5 is not rendered obvious by Abel, alone or in combination with Jaber. Claim 6 depends from claim 5 and is allowable at least by virtue of its dependency. Accordingly, claims 1-20 are not rendered obvious by Abel, alone or in combination with Jaber.

The Director is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment, to our Deposit Account No. 19-1090.

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,  
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